

The Role of Regional Development Policies in Reducing Territorial Disparities

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Abstract

This paper aim is to analyze the variance of the net nominal monthly earnings by counties and development regions using the most recent estimated statistics from Statistical yearbook 2007. We applied one-factor analysis of variance – ANOVA.

We considered that the „Romanian development regions” is a factor of interest and we tested if it has a significant effect on the “net nominal monthly earnings” regional differences.

Keywords: *economic development, social development, competitiveness, growth, regional development*

JEL classification: P51

1. Introduction

The basic aim of the Romanian politics of regional development within European context is the diminution of the existent territorial discrepancies and realize an equilibrium between the different levels of economical and social development of the Romanian counties or statistical regions by laying stress on the stimulation of the balanced development and on the reinforcement of the disadvantaged zones (with a delayed development) and prevention of new discrepancies.

One of the major priorities of the moment consists in designing newly adapted alternatives facing the profound modification of the new representation of the country's political and administrative coherence. It refers to a gradual revision process of the relations between the "center" and the regions, between the better developed areas and the disfavored ones because the Romanian regions are characterized by strong contrasts.

Most of the international studies consider GDP per capita as the best representation of the competitiveness definition. In the last years the GDP per capita has constant annual modifications for all the Romanian regions, but the

beginning grave differences are keeping up, because in Romania, regional disparities have historical, geographical, cultural and economic roots. These disparities, especially those economic, have expanded during transition. In the same economic environment, resources will be orientated to regions that offer the opportunity of a rapid profit growth, and a rapid investment recapture.

Even that the economical grow rates are higher in regions with low level of development, although the economy of the development regions are not stagnate, having an ascendant trend which may denote the intensity of the reducing differences.

There are intraregional differences, too. Counties with a preponderant agriculture economy, with a high rate of unemployment coexist with counties with industrial economy. This phenomenon is the effect of the impact of economy restructuring on the areas with mono-industrial economy, which population was affected by unemployment when the unprofitable firms had been closed.

The most dangerous aspect of economical region disparities is that they determinate the migration phenomena, which resolve in a way the unemployment, but may provoke a lot of social problems.

The regional statistical data which are available in Statistical Yearbook 2007 shows that more than 50% of the civil employments in Romania in 2006 are employees, and the average weight of the gross salaries and other salary rights in structure of money income of households is about 61.1%.

So, starting with such data we consider interesting to analyze if the average net nominal monthly earnings determinates differences inter or intra statistical regions of Romania. We applied one-factor analysis of variance – ANOVA using Microsoft Excel. We considered that the „the development level of the Romanian regions” is the factor of interest and we tested if it has a significant effect on the “net nominal monthly earnings” regional differences.

For providing an overall image of the Romanian counties/regions disparities we consider net nominal monthly earnings relevant indicator, for which the Romanian Statistical Yearbook provides the necessary data. The data have been chosen for the eight Romanian development regions, on the year 2005, the latest year in the Statistical Yearbook 2007 (see Table no.1).

For a basic analysis of data we use Microsoft Excel: Tools/Data Analysis/Descriptive statistics.

The Average Net Nominal Monthly Earnings

Table 1

The Average Net Nominal Monthly Earnings	
Region/County	lei/employee
1. Nord - Est	663
Bacău	718
Botoșani	618
Iași	703
Neamț	603
Suceava	639
Vaslui	608
2. Sud - Est	702
Brăila	622
Buzău	639
Constanța	780
Galați	735
Tulcea	652
Vrancea	632
3. Sud - Muntenia	716
Argeș	756
Călărași	577
Dâmbovița	714
Giurgiu	629
Ialomița	635
Prahova	773
Teleorman	669
4. Sud - Vest Oltenia	734
Dolj	720
Gorj	871
Mehedinți	740
Olt	707
Vâlcea	639
5. Vest	718
Arad	666
Caraș-Severin	629
Hunedoara	761
Timiș	750
6. Nord - Vest	679
Bihor	629
Bistrița-Năsăud	653
Cluj	784
Maramureș	596
Satu Mare	646
Sălaj	689
7. Centru	661
Alba	645
Brașov	681
Covasna	579
Harghita	617
Mureș	671
Sibiu	694
8. București - Ilfov	977
Ilfov	866
Municipiul București	988
Source: www.insse.ro - statistici regionale	

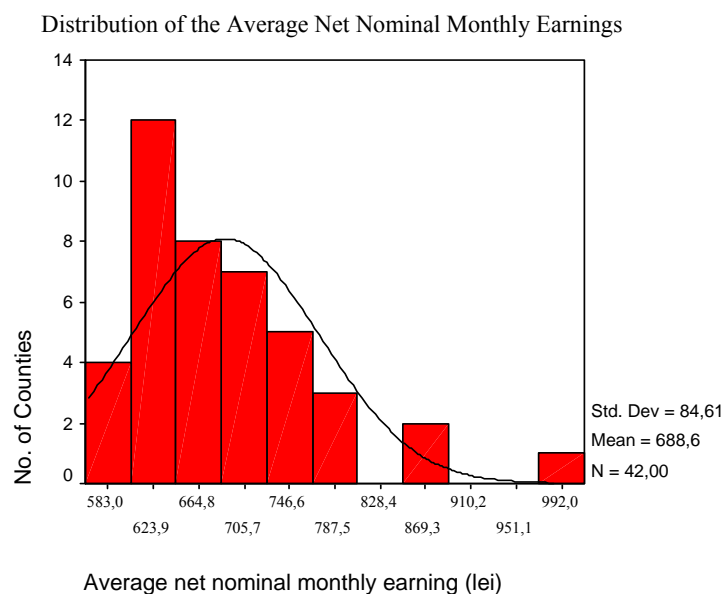


Figure 1 Distribution of the Average net nominal monthly earnings

Average net nominal monthly earnings

Table 2

<i>Descriptive statistics</i>			
Average net nominal monthly earnings (lei)			
Mean	688,642857		
Standard Error	13,0550884		
Median	667,5		
Mode	639		
Standard Deviation	84,6066426		
Sample Variance	7158,28397		
Kurtosis	2,84611438		
Skewness	1,46470481		
Range	411		
Minimum	577		
Maximum	988		
Sum	28923		
Count	42		

Is easy to see that the series of the average net nominal monthly earnings has normal distribution, the mean is 688.64 lei/employee, standard deviation is 84.60 and the coefficient of variation is 12.28%, so the mean, 688.64 lei/employee monthly is relevant.

But, the follow chart confirms the main inter and intra regional disparities in Romania, namely the major imbalance between Bucharest, Ilfov and the other

counties, the important imbalance between the West and the East counties of Romania, the severe underdevelopment of the North-East region.

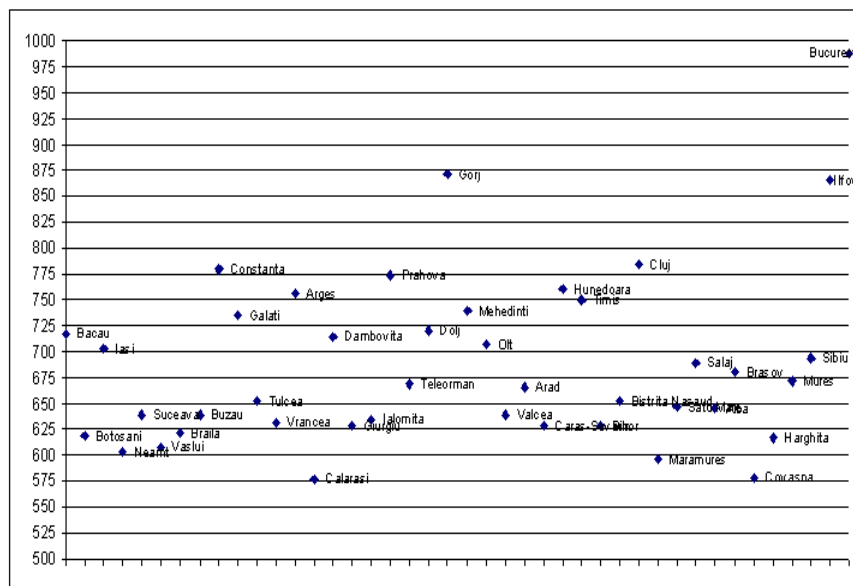


Figure 2 Average net nominal monthly earnings by counties

We can see a relationship between the level of salary and the level of development of the region that the county is.

The highest salaries are in Bucharest, 988lei/employee monthly and Ilfov county, 866lei/employee, levels higher than the mean of the country. The lower salaries are in the counties of Centre and North-Vest regions, much lower than the mean of the country.

So, we can formulate the hypotheses: *as the region is more developed, the average wage of the region is higher*, hypotheses which can be extend to the next level geographically: as the county is more developed economically, average pay will be higher than the average region.

Starting from this prerequisite we try to show that the degree of statistical development of the region is a factor significant change in the average net salary gain by using the statistical method ANOVA. Although the current practice of classifying regions depending on the level of development taking into account a single economic indicator, respectively gross domestic product/capita in this paper for quantifying the level of development of statistical regions of Romania will use the index of regional competitiveness, the complex indicator that takes into account the levels of three categories of indicators: economic, social and technology. In this way, ranking the regions is more realistic than that achieved only when GDP per capita. The regional competitiveness - IC is a weighted averages the three indicators, economic, social and technological developments. In turn each of these three indicators are calculated as a weighted average of selected variables within each interest group (economic, social and technological).

For analyzing, we use one factor analysis of variance is a special case of **analysis of variance (ANOVA)**, for one factor of interest. The ANOVA tests whether the factor has a significant effect on the results.

We apply ANOVA for comparing means and testing the **null hypothesis** that all the region means of the average net nominal monthly earnings are equal: $H_0: \mu_1 = \mu_2 = \dots = \mu_a$ by comparing two estimates of variance (σ^2). ANOVA provides guidance in saying with a level of confidence that a certain factor or factors were the more likely reason for chance of natural variation of a phenomenon.

ANOVA is use to evaluate differences between data sets. Analysis of variance tests the **null hypothesis** that all the **population** means are equal: $H_0: \mu_1 = \mu_2 = \dots = \mu_a$ by comparing two estimates of variance (σ^2).

One estimate, called the Mean Square Error, is based on the variances within the samples. It is an estimate of σ^2 whether or not the null hypothesis is true. The second estimate, Mean Square Between, is based on the variance of the sample means. It is only an estimate of σ^2 if the null hypothesis is true. If the null hypothesis is false then MSB estimates something larger than σ^2 .

The **F ratio** is the probability information produced by an ANOVA. If $F < F_{crit}$, the means are equals, so the **null hypothesis** is accept. We use Index of the regional competitiveness like the influence factor.

For determinate the development level of the statistical regions of Romania we use the index of regional competitiveness, a measure proposed by GEA¹ for computing the regional competitiveness which is more expressive than GDP/capita.

The formula of this index – noted I_C , is expressed as a weighted average of the three indicators, economic, social and technologic.

Each of these three indicators is computed as a weighted average of a three different sets of selected variables:

• **Economic Indicator** (I_E): E_1 - GDP/Capita, E_2 – GDP Growth Rate, E_3 – Labour Productivity, E_4 – Net Exports, E_5 – Gross Fixed Capital Formation, as % of GDP and E_6 – Net Income/Capita.

$$I_E = \frac{10 \cdot E_1 + 10 \cdot E_2 + 30 \cdot E_3 + 10 \cdot E_4 + 20 \cdot E_5 + 20 \cdot E_6}{100} \quad (1)$$

• **Social Indicator** (I_S): S_1 – Regional Dispersion of Occupancy Rates, S_2 – Occupancy Rate (Total), S_3 - Occupancy Rate (Women), S_4 – Average Life Expectancy Index.

$$I_S = \frac{30 \cdot S_1 + 40 \cdot S_2 + 10 \cdot S_3 + 20 \cdot S_4}{100} \quad (2)$$

¹ "The Handbook for Regional Competitiveness Assessment", a result of the GOF - finance project "Romania – Building Regional Assessment Capacity in Line with the Lisbon Agenda", Bucharest, 2007, p. 36

• **Technological Indicator** (I_T): T_1 – Total R&D Expenses, T_2 – Occupancy Rate in High Tech Sectors, T_3 – Postgraduate Education in the R&D Sector.

$$I_T = \frac{40 \cdot T_1 + 30 \cdot T_2 + 30 \cdot T_3}{100} \quad (3)$$

Each of the three indicators is normalized relative to the national average, the latter taken to be one.

The regional competitiveness index is computed as a weighted average of the three indexes, economic, social and technological according to:

$$I_C = \frac{40 \cdot I_E + 30 \cdot I_S + 30 \cdot I_T}{100} \quad (4)$$

The regional competitiveness indexes and the ranks by the regional competitiveness indexes determinate by GEA for 2005 are presented in Table no. 3

The regional competitiveness index

Table 3

Region	Economic Indicator IE	Social Indicator IS	Technological Indicator IT	Regional Competitiveness Index
North East	0.71	0.96	0.71	0.79
South East	0.83	1.01	0.29	0.72
South Muntenia	0.78	0.98	0.63	0.79
South West	0.91	0.97	0.33	0.75
West	1.06	0.99	0.88	0.99
North West	0.80	1.01	0.99	0.92
Center	0.83	1.04	0.65	0.84
Bucuresti-Ilfov	1.13	1.03	3.01	1.66

Source: GEA, based on CNP data

Conclusions

An empirical analysis indicate that with a correlation coefficient equal with 0,576 there is a significant relationship between the two indicators of the regions, so it is possible that the level of the competitiveness has an important influence on the average net nominal monthly earnings by employee.

So, we use Excel for one factor analysis of variance we obtained the following results.

Report				Correlations			
Average net nominal montly earning							
Index of the region	Mean	N	Std. Deviation			Average net nominal montly earning	Index of the region competitiveness
,71	676,67	6	64,95				
,75	735,40	5	84,77				
,76	648,17	6	50,06				
,80	679,00	7	71,80				
,87	647,83	6	43,51				
,92	666,17	6	65,25				
,99	701,50	4	64,31				
1,78	866,00	1	,				
178,00	988,00	1	,				
Total	688,64	42	84,61				
				Average net nominal montly earning	Pearson Correlation	1,000	,576**
					Sig. (2-tailed)	,	,000
					N	42	42
				Index of the region competitiveness	Pearson Correlation	,576**	1,000
					Sig. (2-tailed)	,000	,
					N	42	42

** . Correlation is significant at the 0.01 level (2-tailed).

Figure 3 ANOVA results

ANOVA single factor

Table 4

Anova: Single Factor					
SUMMARY					
Groups	Count	Sum	Average	Variance	
North-East	6	3889	648,1667	2506,167	
South-East	6	4060	676,6667	4218,267	
South-Muntenia	7	4753	679	5155	
South-West Oltenia	5	3677	735,4	7186,3	
West	4	2806	701,5	4136,333	
North-West	6	3997	666,1667	4258,167	
Center	6	3887	647,8333	1892,967	
Bucharest-Ilfov	2	1854	927	7442	
ANOVA					
Source of Variation	SS	df	MS	F	P-value F crit
Between Groups	149585,61	7	21369,37	5,048911	0,000531 2,293831
Within Groups	143904,03	34	4232,472		
Total	293489,64	41			

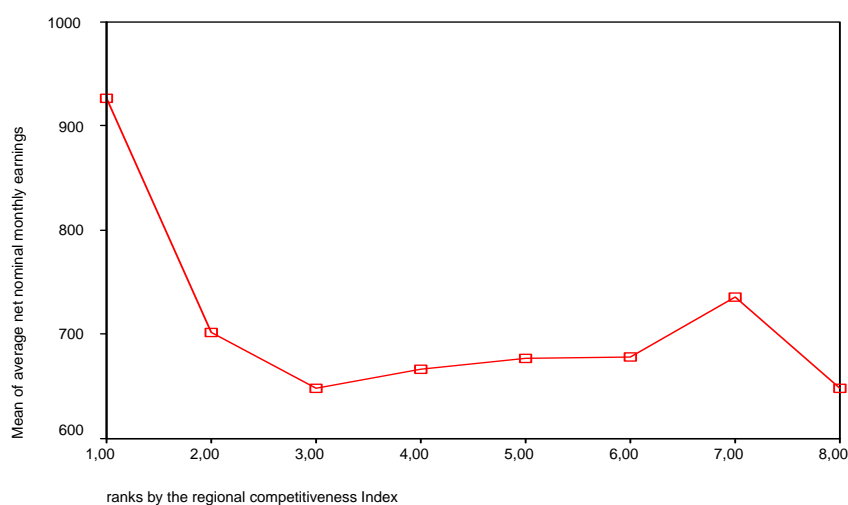


Figure 4 Ranks by regional competitiveness

$F = 5.048911 > F_{crit} = 2.293831$, so, the means are not equals; the regions are not homogeneous and consider that a variance analysis is justified. We will test if the development level of the region is a significant factor of influence for the level of the average net nominal monthly earnings by employee.

So, We computes an R-squared value (R-Sq):

$$R^2 = \frac{SS_{\text{between groups}}}{SS_{\text{total}}} = \frac{149585,61}{293489,64} = 0,50968 \quad (5)$$

This value, shows the percent of explained variation by the factor that we had considered. Here, the factor only explains 50,96% of the total variation; hence, it is not a very good explanation.

Romania has salary differences dictated by the region where employees are. The main cause triggering such differences is the low unemployment rate registered in Bucharest, which forces employers to offer high salaries to keep their employees.

Most likely, differences will remain, with some exceptions. In some counties, where economic concentrations are already being formed, salaries are on a par with those in Bucharest. In other counties, salaries will remain low as long as business initiatives and investments stay the same.

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